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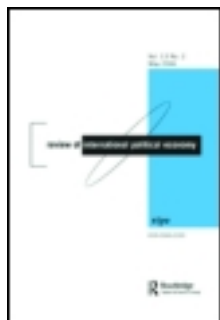
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# The role of shadow banking entities in the financial crisis: a disaggregated view

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## ABSTRACT

This article examines the role of the shadow banking system in the global financial crisis of 2007–9. In order to do this, one must first explain the reasons for the explosive growth of shadow banking in the immediate pre-crisis era. Current explanations for this growth tend to hold two contrasting positions: one emphasising factors endogenous to the banking sector (notably regulatory arbitrage and financial innovation); the other emphasising exogenous factors (notably the ‘search for yield’). Integrating these two explanations, in this article we develop a disaggregated view of the shadow banking system. After clarifying the nature of the relation between the regulated and shadow banking systems, we inquire more closely into the different entities that inhabit the shadow banking system, the different activities that these entities performed and the different financial products that these entities supplied. The disaggregated view of shadow banking suggests that while some parts of the system played an important role in the initial subprime phase of the crisis through their involvement with the toxic securities that were at its centre, other parts of the system were key to the subsequent money and inter-bank phases of the crisis through their close ties with the regulated banks.

## KEYWORDS

shadow banking; securitization; financial crisis; financial regulation.

## 1. INTRODUCTION

The shadow banking system, broadly defined as a complex credit intermediation network operating outside of the regulated banking sector, has existed for decades. Yet it was only with the outbreak of the financial crisis in the summer of 2007 that it became the subject of serious discussion. Central to this debate has been the question as to why the shadow

banking system expanded so rapidly in the run up to the meltdown of 2007–9. From the early 1950s right through to the late 1990s, the system grew at a rate low enough to keep its size on average just below that of the regulated banking system. Had the shadow banking system continued to grow at the same comparatively low rate at the start of the new millennium, the financial crisis may not have occurred, or, at the very least, it may not have assumed the seismic proportions that it did. The fact of the matter, however, is that from about 2000 to mid-2007 the shadow banking system expanded with such phenomenal speed that by the summer of 2007 its size dwarfed that of the regular banking system. In other words, the shadow banking system had, in a short span of time, expanded to such proportions as to ensure that the problems surfacing within it during 2007 were sufficient to bring the whole global financial system to the brink of collapse.

Explanations for the pre-crisis shadow banking growth have tended to hold two contrasting positions. The first and more popular position is to emphasise factors that are endogenous to the banking sector as a whole, chief amongst these being regulatory arbitrage and financial innovation (e.g. Gorton, 2010; Gorton and Metrick, 2010; McCulley, 2009; Schwarcz, 2012). On the one hand, given the costs arising out of the regulatory constraints on their on-balance sheet activities, the large commercial banks found it advantageous to shift increasing amounts of these activities off their balance sheets in order to conserve capital and boost profits. On the other hand, the virtual absence of any systematic regulation of their off-balance sheet vehicles placed the commercial banks in an excellent position to exploit advances in financial technology to the full. The second position is to emphasise factors exogenous to the banking sector, chief amongst these being the ‘search for yield’ on the part of hedge funds, pension and mutual funds and other institutional investors (e.g. Blankfein, 2009; Caballero, 2010; Goda *et al.*, 2013; Goda and Lysandrou, 2014; Lysandrou, 2009; Lysandrou, 2012). The central argument here is that given the unusually low yields in the traditional bond markets in the immediate pre-2007 period, the shadow banking system came under intense external pressure to supply additional quantities of yield-bearing securities needed by investors.

Although both explanations have their strengths, they also have their weaknesses. That of the ‘endogenous’ theory of shadow banking concerns the time frame: financial deregulation and the financial innovation process had been evolving globally long before 2000, so why was it only from this point that the shadow banking system suddenly exploded in size? The ‘exogenous’ version is on stronger ground here. However, its major weakness concerns the relation between the regulated and unregulated parts of the banking sector. If the latter was rapidly expanded from the early 2000s in order to supply increasing volumes of securities to

non-shadow bank institutions, why then was it the regulated banking sector that suffered far more damage than any other part of the financial system in the course of the financial crisis that ensued? It is the 'endogenous' theory of the origins of shadow banking that appears to have the stronger answer to this question.

The upshot of the above observations is that any truly compelling account of the explosive growth of the shadow banking system in the immediate pre-crisis period has to be one that integrates the 'endogenous' and 'exogenous' versions of the growth story. This article attempts this task by developing a disaggregated view of the shadow banking system. After clarifying the nature of the relation between the regulated and shadow banking systems, we examine more closely the different entities that comprised the shadow banking system, the different activities that these entities performed and the different financial products that these entities supplied. Such a disaggregated view of the shadow banking system as it operated at the time of the financial crisis suggests that while some parts of shadow banking played an important role in the initial subprime phase of the crisis through their involvement with the toxic securities that were at its centre, other parts of the system were central in the subsequent money and inter-bank phases of the crisis through their close ties with the regulated banks.

This article is structured as follows. Section 2 outlines the relation between the regulated and shadow banking systems on the eve of the crisis. Section 3 discusses the role of the special purpose entities (SPEs) and special investment vehicles (SIVs) in the crisis. Section 4 discusses the role of the conduits in the crisis. Section 5 briefly discusses policy implications. Section 6 gives some conclusions.

## 2. THE SHADOW BANKING SYSTEM ON THE EVE OF THE CRISIS

The shadow banking system had been growing for some time prior to the outbreak of the financial crisis in 2007 (e.g. Rajan, 2005), but it was only at this critical juncture that it began to command serious attention and even acquire a name. It was Paul McCulley, then of PIMCO, who in his 2007 speech at the Federal Reserve Conference introduced the term 'shadow banking', to describe 'the whole alphabet soup of levered up non-bank investment conduits, vehicles and structures' (McCulley, 2007). Despite its pejorative connotations, the term has been widely endorsed because it neatly captures the principle of inverse parallelism: the fact that certain activities conducted by the shadow banking sector in the pre-2007 period were both similar to those conducted by the regular banking sector and at the same time distinct in that they fell outside the scope of regulatory supervision. When first introducing its discussion of the shadow banking

system, the Financial Stability Board (FSB) was content to respect this principle. To quote its opening definition: shadow banking is a 'system of credit intermediation that involves entities and activities outside the regular banking system' (FSB, 2012a: 1). The US Financial Crisis Inquiry Commission's report of 2010 also emphasised this inverse parallelism when it referred to the shadow banking's 'bank-like financial activities that are conducted outside the traditional commercial banking system, many of which are unregulated or lightly regulated' (FCIC, 2010: 1).

As not all entities and activities outside of the regular banking system pose the same level of risk, the FSB went on to give a second, narrower definition of shadow banking that includes only those areas of it that do pose a potentially substantial systemic risk. To quote: 'the portion of the shadow banking system that merits increased attention from authorities can be defined as "a system of credit intermediation that involves entities and activities outside the regular banking system and raises i) systemic risk concerns, in particular by maturity/liquidity transformation, leverage and flawed credit risk transfer, and/or ii) regulatory arbitrage concerns"' (FSB, 2012b: 2).<sup>1</sup> This second definition, while possibly useful for policy purposes is, in our view, unsatisfactory for the simple reason that its central preoccupation is with the systemic effect of shadow banking activities whereas it should be with their specific function. When one defines a 'car' as a vehicle for transportation, one does not usually include in that definition the possibility that if a car is driven too fast or too carelessly it can cause death. Similarly, with shadow banking: the system may indeed, as has turned out to be the case, pose huge systemic risks by virtue of its unregulated and non-transparent nature, but its definition should nevertheless home in on its functionality. In other words, the study of the phenomenon of shadow banking, and hence its conceptualisation, should focus on the reasons behind the expansion of the system to the point where it could cause serious systemic damage. To this end we propose as an alternative definition of the shadow banking system the following: 'the shadow banking system is a system of unregulated off-bank balance sheet credit intermediation and maturity and liquidity transformation activities conducted by bank owned or sponsored entities in the capital and money market domains for the primary purpose of expanding the rate of production of yield bearing debt securities required by the global investor community.'

Our definition of the shadow banking system differs from that of the FSB's in several important respects, which are illustrated in Figure 1. The first difference centres on the distinction between on- and off-bank balance sheet activities. There are instances, contemporary China is a case in point, where certain banks can engage in on-balance sheet credit intermediation activities that fall outside of the scope of official regulation and can therefore be classified as 'shadow' banks. However, as this type of



**Table 1** Outline of the commercial bank-shadow bank nexus at the time of the sub-prime crisis.

On-balance sheet banking: regulated							
Capital-money markets			Banks		Capital-money markets		
Sellers		Buyers	Assets	Liabilities	Sellers		Buyers
Governments	Securities	Banks	Cash	Share Capital	Banks	Securities	Asset Managers
Corporations			T-Bills	Money Market			Money Market Funds
Other Banks			T-Bonds	Borrowing			
Non-Bank Financial Institutions			Securities	Bond Issues			
			Mortgage Loans	Deposits			Corporate Treasurers
			Credit Loans				

Off-balance sheet banking: unregulated			
Banks	Shadow bank entities		Capital-money markets
Sellers of Loans	Assets	Liabilities	Buyers of Securities
	SPEs: Conforming Loans	SPEs: ABS ABCP	
	Non-conforming Loans	Other Money Market Funding	
	SIVs: ABS	SIVs: CDOs ABCP	
	Conduits: Loans ABS CDOs	Conduits: ABCP	Other Shadow Bank Entities Money Market Funds Corporate Treasurers

shadow banking was not central to the financial crisis that unfolded in the US and EU we shall exclude it from the current discussion and reserve the term shadow banking to refer exclusively to the unregulated off-balance-sheet entities and activities that are presented in the bottom half of [Table 1](#).

The second difference with the FSB's definition concerns the relationship between the banking sector on one hand, and the capital and money market sectors on the other. In the regulated banking sphere, the credit intermediation and attendant maturity and liquidity transformation functions are usually performed by banks without recourse to any intermediary role on the part of the capital and money markets. There is, of course, a close association between these sectors, as shown in the top half of [Figure 1](#): on the asset side of banks' balance sheets the capital and money markets represent important sources of securities needed by the banks, while on the liability side of banks' balance sheets these same markets represent important sources of demand for securities issued by the banks. However, the close association between the banking and capital markets sectors is not in this case one that erases the distinction between

these sectors and the different types of activities taking place within them. By contrast, this is the case in the shadow banking realm where the capital and money markets are indispensable to the credit intermediation and maturity/liquidity transformation functions performed by the special purpose entities (SPEs), structured investment vehicles (SIVs) and conduits. As shown in the bottom half of [Figure 1](#), these three major types of off-balance-sheet vehicles operating at the time of the subprime crisis constituted the central medium through which the basic banking activities of taking deposits and extending loans on one side of the equation were indissolubly mixed with the basic capital and money activities of buying and selling securities on the other.

The third difference between our definition of the shadow banking system and that of the FSB's concerns the 'stock-flow' distinction. Schwarz (2011-2: 621) argues that while official definitions of shadow banking only include entities and activities, a proper definition should also capture the 'essential element of shadow banking', which 'is that non-banks provide financial products and services.' What Schwarz is in effect saying is that activities performed by shadow bank entities should be viewed not only from a flow perspective, one where the focus is on activities as financial transformation processes, but also from a stock perspective, one where the focus is on the 'products' that result from those transformation processes. The flow perspective on the shadow banking system is symptomatic not only of the official definitions of the system but also of many academic definitions. A classic case in point is Mehrling's (2012) description of shadow banking as 'money market funding of capital market lending', a description that neatly captures the flow dimension of the relationship between money and capital market activities, but leaves out their stock dimension, the fact that these activities result in securities, tangible financial products.

While other academics do bring in this stock dimension, they tend to do so in a way that subsumes it under the flow dimension. Pozsar and Singh (2011), for example, specify three key functions undertaken by shadow banks: reverse maturity transformation (where conventional banks convert short-term deposits into long-term loans shadow banks do the opposite, convert risky and opaque long-term assets into money-like, short-term liabilities); collateral mining (obtaining collateral involves both exploration, looking for deposits of collateral, and extraction, the 'unearthing' of passive securities so that they can be re-used as collateral for various other purposes in the shadow banking system); liquidity transformation (in a securitised lending structure, liquidity is created on the balance sheet of a separate institution that, through techniques of diversification and aggregation, 'arbitrages' higher-risk lower-liquid assets into lower-risk higher-liquid assets). In each of these characterisations of the functions performed by shadow banks their stock dimension

is alluded to through references to 'assets', 'securities', etc, but, as we say, this dimension is not sufficiently demarcated from the flow dimension.

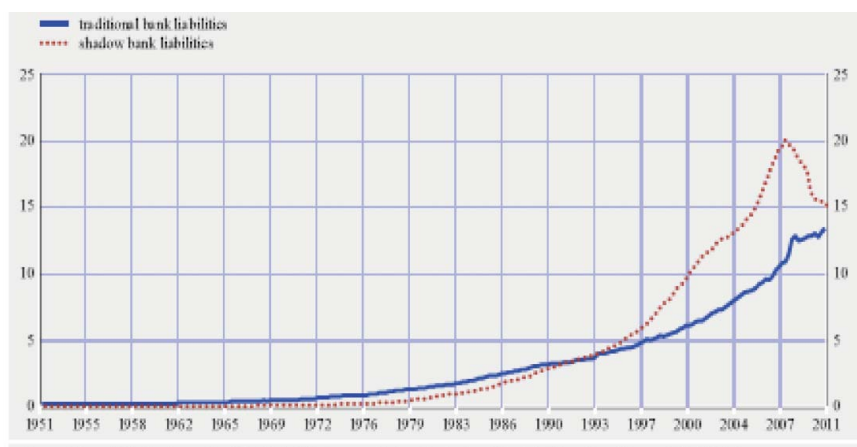
By contrast, our definition of the shadow banking system respects the flow and stock dimensions of its activities in a way that not only maintains a clear distinction between them but also accords them co-primacy: if the various financial transformation activities performed by the shadow bank entities represent the flow side of their functions, the creation of yield-bearing securities whose usefulness to buyers is to serve as stores of value represent the equally important stock side of their functions. The securities supplied by the shadow banking system right up to the outbreak of the crisis essentially fell into two categories: short term and long term. The predominant type of short-term security was asset-backed commercial paper (ABCP). From a flow perspective, ABCP merely represents a form of short-term funding of the long-term assets held by the conduits and SIVs. Yet from a stock perspective it represents an important type of value container demanded by short term investors and most notably by the money market funds (MMFs). The predominant types of long term securities were asset-backed securities (ABS) and CDOs. Once again, while these credit instruments in one sense merely represent forms of capital market lending funded by money market borrowing, they also represent important supplements to the world's stocks of investable securities demanded by long-term investors such as insurance companies and pension and mutual funds.

Defining the shadow banking system in a way that brings out the functional stock-flow distinction has an important bearing on how to evaluate the system's role in the financial crisis, because the distinction helps to delimit the boundaries that separate those entities operating at the core of the system from those operating at its periphery. This demarcation between core and periphery is either absent or blurred in most other definitions of shadow banking because in prioritising the flow dimension of activities in the system just about every linkage between every entity performing any type of credit intermediation and maturity/liquidity transformation role is placed on an equal par. Indeed, this is why illustrations of the system (see, for example, Pozsar *et al.*, 2010) often end up presenting it as something resembling a computer circuit board or a Byzantine network of cells and channels. The problem that then results from this holistic view of the system is that it becomes difficult to identify the particular part played by particular entities at particular points in the financial crisis that unfolded over 2007–9. On the contrary, this task becomes easier when the shadow bank system is examined from a disaggregated perspective that ascribes as much importance to the stock dimension of activities as to the flow dimension because it then becomes possible to single out the SPEs, SIVs conduits as the core of the system. As these were the only entities actually supplying the credit-backed securities that

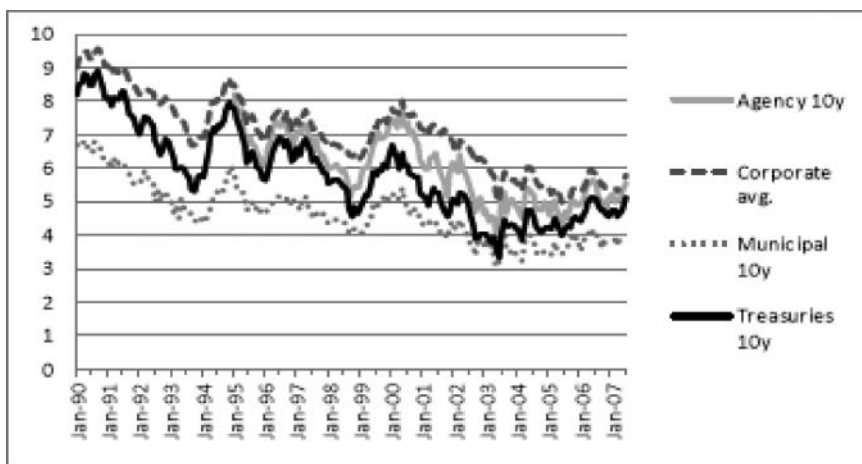
were at the centre of the crisis, we can track each entity's involvement in the crisis by focusing on the particular securities it created. In elaborating on this argument, we begin by looking at the role of the SPEs and the SIVs.

### 3. THE ROLE OF THE SPES AND SIVS IN THE CRISIS

The gross liabilities of a country's shadow banking system are usually taken as a measure of its size. In this frame, [Figure 1](#) shows that the rate of expansion of the US shadow banking system, while largely flat from the early 1950s and moderately steady from the early 1980s to the early 2000s, suddenly exploded between that period and the outbreak of the financial crisis. What has captured the attention of most commentators is the fact that in this immediate pre-crisis period the size of the US shadow banking system began to dominate that of the regular US banking system (e.g. Pozsar *et al.*, 2012). This comparison is common in the conventional analyses of the financing function of the banking sector: if the main pre-occupation is with the flow dimension of its credit intermediation and maturity/liquidity transformation activities, then it makes sense to compare the volume of these activities performed by the shadow banks with the volume performed by their regular counterparts. If, however, the angle of analysis also focuses on the stock dimension of these activities, that is, on the 'products' resulting from them, then the more relevant comparison is between developments in the US shadow banking system on the one hand and developments in the US bond markets on the other. As can be seen by comparing [Figure 1](#) with [Figure 2](#), there was a close



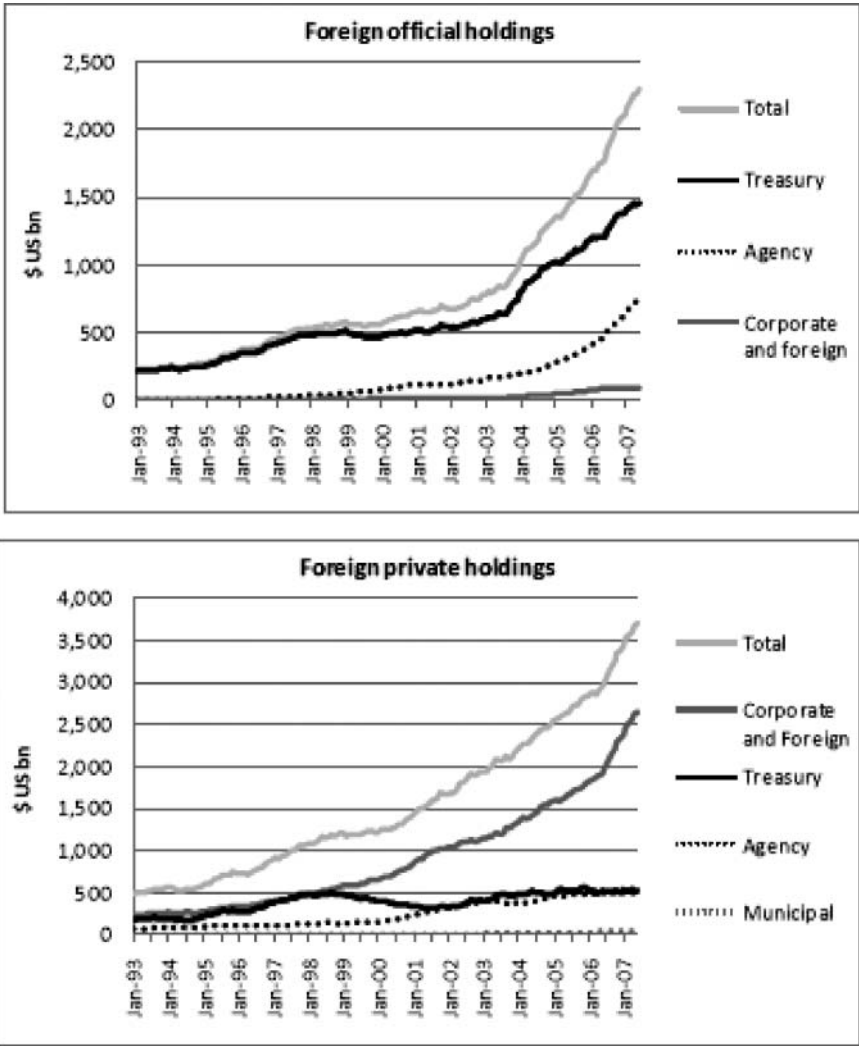
**Figure 1** The growth of the US shadow banking system. *Source:* Pozsar *et al.* (2012).



**Figure 2** US bond yields 1990–2007. *Source:* Goda *et al.* (2013)

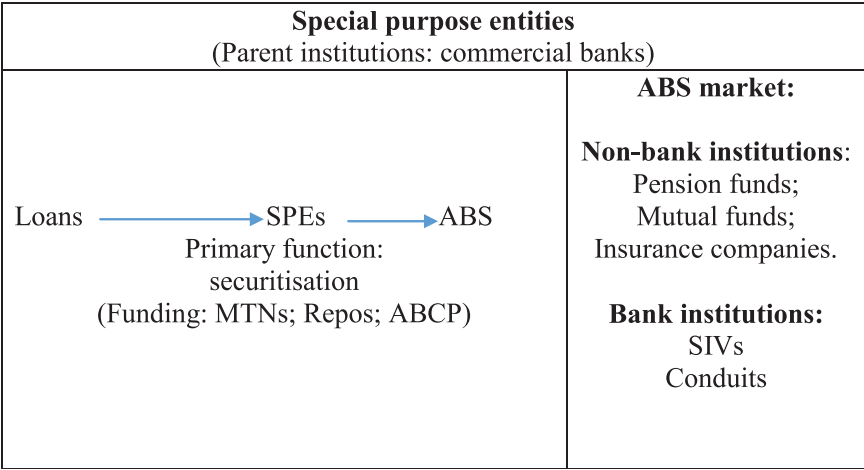
correlation between the growth of US shadow banking between 2002 and 2007 and the unusually low yields in the major US bond markets that persisted over this same period. This correlation was no mere coincidence but a direct reflection of the growing demands made upon the US shadow banking sector to help resolve the increasingly pressing yield problem.

The source of the yield problem can be traced back to the relationship between the world's supply of government and corporate debt securities and the world's demand for these securities. That relationship remained broadly balanced up to the early 2000s, but then became unbalanced as global demand began to outstrip global supply. Traditionally, the major sources of demand for US debt securities are the large institutional investors of the US and other advanced market economies, most notably insurance companies and pension funds. However, as shown in Figure 3, in the decade prior to the crisis foreign sources of demand became increasingly important, most notably those from governments, institutional asset managers and high net worth individuals (HNWIs) based in the emerging market economies (EMEs). Despite the pre-crisis era changes in the geographical composition of world demand for securities, there was no corresponding change in the geographical composition of world bond supplies as attested by the fact that at end-2006 over 80% of the world's bond stocks of approximately \$67 trillion were accounted for by the G7 countries while the EMEs at the other end of the spectrum accounted for a mere 9%, a figure that contrasts sharply with the EME's 34% share of world GDP at that same time (see Lysandrou, 2013). Given the lack of investable bonds in the EMEs and given the dominant position



**Figure 3** Foreign holdings of US debt securities. *Source:* Goda *et al.* (2013)

of the US bond markets (accounting for 46% of global stocks in 2006) it was inevitable that the pressure of global demand for bonds would be concentrated in these latter markets thereby helping to force the US treasury yield and other US long term yields down to unusually low levels. To quote Caballero (2010: 3), '[t]he entire world, including foreign central banks and investors, but also many US financial institutions, had an insatiable demand for safe debt instruments which put enormous pressure

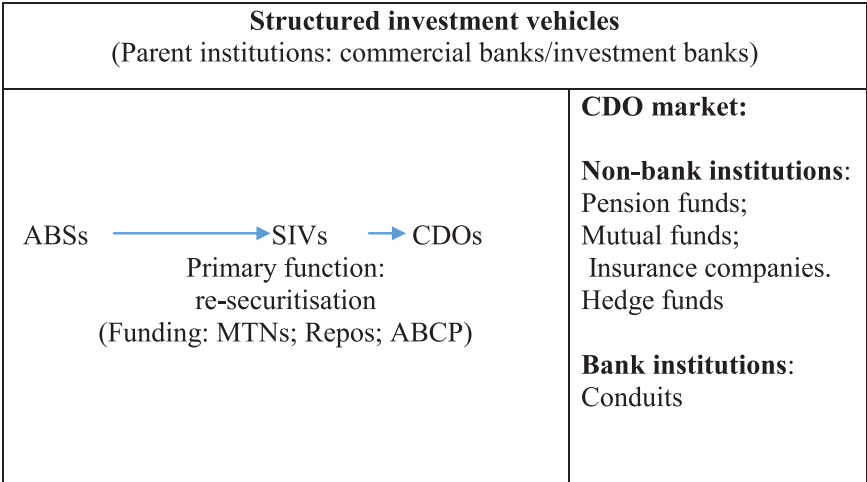


**Figure 4** Core shadow banking entities: SPEs.

on the US financial system and its incentives.’ Bernanke *et al.* (2011) and Goda *et al.* (2013) make similar arguments.

The first way in which the US shadow banking sector was pressed into helping resolve the yield problem was by getting it to rapidly increase its rate of production of asset-backed securities, the SPEs being the core shadow banking entity charged with this task. As shown in Figure 4, the SPEs used a variety of short-term funding instruments to finance purchases of long term mortgage and other credit loans that would then be securitised, with the resulting ABS marketed both outside of the banking sector to a variety of institutional investors and inside the sector, namely to the SIVs and conduits, more on which below. The non-bank institutional demand for ABS played a largely accommodating role in the original development of the US ABS market dating from the 1970s. Rather, this early development was chiefly driven by supply push factors as government sponsored enterprises such as Fannie Mae and Freddie Mac – and later on private commercial banks – resorted to securitisation as a means of increasing residential mortgage lending while at the same time conserving capital. However, by the 2000s, demand-pull pressure from non-bank financial institutions took over as the main driving force behind US ABS expansion, as is strongly indicated by the time scale of events. Of the US shadow banking system’s \$22 trillion gross liabilities in 2007, over \$9 trillion consisted of asset-backed securities, a sum that represented over 80% of the world’s total ABS stocks of \$11 trillion outstanding at that time. However, an even more striking statistic is that approximately \$5.4 trillion of the US ABS figure for 2007 had been created after 2002 (IMF, 2008). The US ABS market had been in existence for



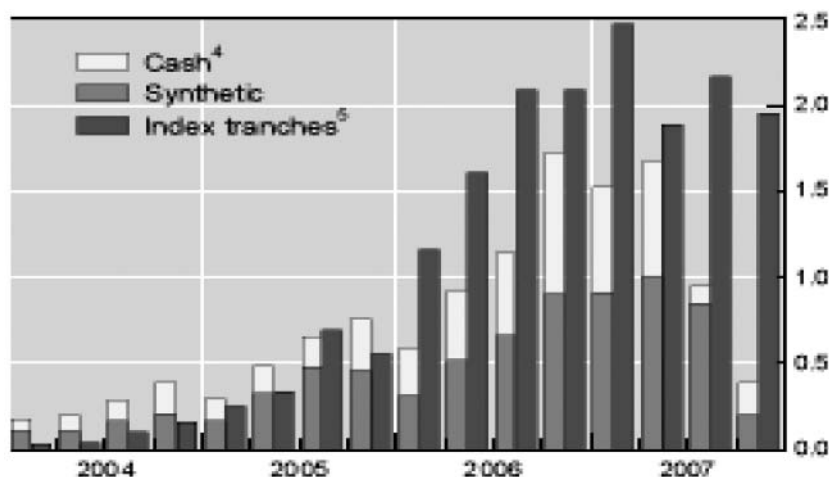


**Figure 5** Core shadow banking entities: SIVs.

over four decades and yet well over half of its ABS stocks by the time of the crisis in 2007 had been created in the preceding four years, in other words, in precisely the same period when low treasury and corporate bond yields remained an acute problem for investors.

While the rapid increase in the supplies of ABS in the US may have gone some way towards alleviating the yield problem, it certainly did not go all the way as evidenced by the fact that, despite the supply increases, ABS yields also continued to remain unusually low right up to 2007. This observation brings us to the second way in which the US shadow banking system was pressed into helping resolve the yield problem. Given the continuing shortfall in the supplies of US ‘first floor’ asset-backed securities relative to global demand, the system had to make up for the shortfall by expanding the rate of production of CDOs, ‘second floor’ securities, securities backed by securities backed by loans. The core shadow banking entities charged with this function were the SIVs. As shown in [Figure 5](#), these vehicles also used a variety of short-term lending instruments to finance purchases of mortgage and other credit-backed securities from the SPEs, these securities then being combined together as backing collateral for CDOs, the bulk of which comprised AAA-rated tranches. SIVs created high-grade securities out of lower grade ones through the use of three major credit enhancement techniques (CETs): over-collateralisation (the volume of backing assets held is greater than the volume of securities issued), subordination (interest payments on super senior and senior securities are made first and only then are holders of the mezzanine tranche securities paid and so on





**Figure 6** CDO issuance. *Source:* Borio (2008).

in descending order) and insurance (the senior tranches were given insurance cover by a sponsoring bank, an insurance company or mono-line insurer). The market for CDOs, as also shown in Figure 6, comprised both non-bank financial institutions, primarily hedge funds but also conventional institutional asset management firms, and other shadow bank institutions, notably the conduits.

Despite the increase in the rate of CDO production after 2002, this rate was still not high enough to satisfy investor demand. Thus it was that, from this point on, as can be seen in Figure 6, synthetic and index tranche CDOs (artificial CDOs constructed by using cash CDOs as reference entities for credit default swaps) began to replace cash CDOs as the predominant type. As one commentator observed at the time: '[t]he increase in synthetic securitisations in the US can be attributed to several factors. Among them are the enormous popularity of cash CDOs among hedge fund investors and the ensuing shortage of hard asset collateral' (Clark, 2008: 31). Where cash CDOs could take several months to create, synthetic CDOs could be established in a matter of days and where cash CDOs require the involvement of regular and shadow bank institutions at every stage of their creation, synthetic and index tranche CDOs make no such requirement. A measure of the increasing extent to which non-bank institutional investors were creating artificial CDOs on their own initiative is given by the changes in the participation ratios in the market for credit derivatives between 2004 and 2006: while the percentage share of banks fell from an average of 63% to an average of 48% over this period, the percentage share of non-bank institutions rose by the opposite amounts with the key driving force in this respect being the hedge funds,

**Table 2** Holders of CDOs: 2006.

CDO Tranche	Insurance %	Hedge Fund %	Bank %	Asset Mgr %
AAA	6.9	12.1	14.5	5.8
AA	1.2	4.0	3.5	4.0
A	0.3	4.6	1.4	2.9
BBB	0.6	4.3	0.3	4.0
BB	0.0	2.3	0.3	0.3
Equity	0.9	19.1	4.9	1.7
<b>Total %</b>	<b>9.8</b>	<b>46.5</b>	<b>24.9</b>	<b>18.8</b>
<b>Total \$bn</b>	<b>295</b>	<b>1396</b>	<b>746</b>	<b>564</b>

Source: Blundell-Wignall (2007)

which became second to the banks as buyers and sellers of protection (IMF, 2008).

The conclusion that follows from the above arguments is that the ‘exogenous’ explanations of the growth of the shadow banking system to the point where it could cause enormous damage to the rest of the global financial system have a great deal of plausibility. Had the US ABS and CDO markets remained as small in 2007 as they had been just five years earlier in 2002, the emergence of problems in those markets may not have had any significant spill-over effect in the other financial markets. However, this is conjecture. The fact of the matter is that by 2007 these markets had grown to a large enough size as to be able to wreak general havoc when they experienced problems, and the principal driving forces behind that market growth were the institutional investors searching for yield. The external pressure on the shadow banks to create extra stocks of yield-bearing securities was high. Not only were the institutional investors by far the largest holders of ABS in 2007 (see, for example, Goda *et al.*, 2013) but also the largest holders of the \$3 trillion worth of CDOs outstanding at that time, with approximately 75% as compared with the 25% held by the shadow banking sector, as can be seen in Table 2.

While confirming the validity of the ‘exogenous’ explanation of shadow banking growth and its consequences, the last of the above observations also raises a set of important questions. If the shadow banking sector had indeed succeeded in distributing the majority of the toxic CDOs that it had created to institutions outside of the sector, with the latter itself remaining only a minority holder by the time of the subprime crisis, why did it suffer such enormous damage on the outbreak of that crisis? Furthermore, why did this damage extend to the regular banking sector such as to bring it to the brink of collapse? To answer these

questions we need to inquire into the third of the entities that constituted the core of the shadow banking system, namely, the conduits.

4. THE ROLE OF THE CONDUITS IN THE CRISIS

In common with the other shadow bank entities, the liquidity and maturity transformation activities of the conduits resulted in securities that were sold to a wide variety of investors, in this case short-term securities, ABCP, the principal source of demand for which came from the money market mutual funds (MMFs). That said, the one important difference separating the conduits from the other two entities is that they did not typically engage in securitisation (neither the straightforward securitisation of loans as did the SPEs nor the re-securitisation of securities as did the SIVs). Rather, their primary function, as shown in Figure 7, was simply to maximise the profits to be made from exploiting the difference in the interests received on the assortment of long-term assets that they held and the interests that they paid on their short-term liabilities.

The functional differences between the conduits and the SIVs are clearly brought out in Table 3, which reproduces the IMF's own summary of the distinguishing features of these entities. Note that while the SIVs were officially classified as entities whose 'assets are traded', the conduits were classified as entities whose assets largely consisted of 'nontradable loans'. Note also the significant difference in the size of assets held respectively by these two types of entities on the eve of the crisis: SIVs held a much lower amount of assets (\$400 billion) compared with the amount (\$1.4 trillion) held by the conduits, a difference in keeping with the fact that while the SIVs' chief source of profits was the fees

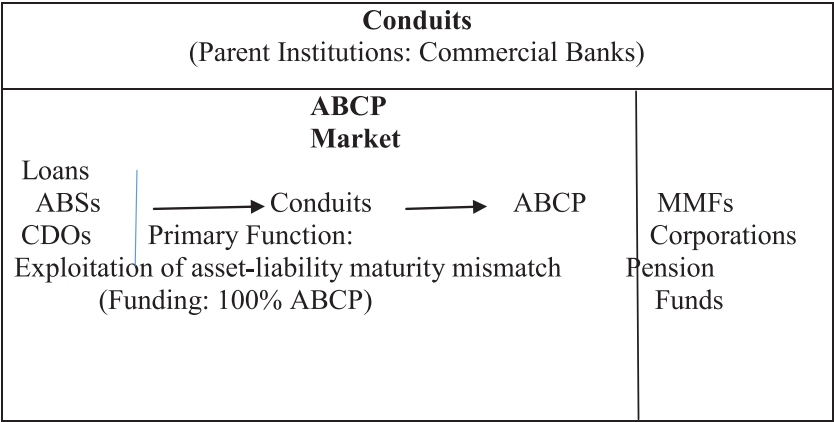


Figure 7 Core shadow banking entities: conduits.

**Table 3** Characteristics of Conduits and SIVs.

	Conduit	SIV
Assets	<ul style="list-style-type: none"> <li>• US\$ ≈1,400 billion</li> <li>• Nontradable loans</li> <li>• Less risky</li> <li>• 47% Traditional assets</li> <li>• 53% Securities and derivatives</li> </ul>	<ul style="list-style-type: none"> <li>• US\$ ≈ 400 billion</li> <li>• Assets are traded</li> <li>• Less risky</li> <li>• ≈ 28% Financial institutions' debt</li> <li>• ≈ 48% CMBS/RMBS/ABS</li> <li>• ≈ 22% CDOs/CLOs</li> <li>• ≈ 2% Other</li> </ul>
Liabilities	<ul style="list-style-type: none"> <li>• 100% Commercial paper</li> </ul>	<ul style="list-style-type: none"> <li>• 27% ABCP</li> <li>• 66% Medium-term notes</li> <li>• 7% Capital notes</li> </ul>
Credit enhancement	<ul style="list-style-type: none"> <li>• Varied (sponsoring bank)</li> </ul>	<ul style="list-style-type: none"> <li>• Overcollateralization</li> </ul>
Liquidity facility	<ul style="list-style-type: none"> <li>• Contractual 100% coverage</li> </ul>	<ul style="list-style-type: none"> <li>• Contractual &lt; outstanding liabilities</li> <li>• ≈ 10 to 15 percent of senior debt</li> </ul>

Source: IMF (2008) .

earned from the sales of CDOs, the conduits' chief source of profits came from the difference between the returns on their asset holdings and the interest payments on their commercial paper.

While the conduits differed from the SIVs in terms of asset size at the time of the subprime crisis, there was no basic difference as concerns the percentage share of CDOs in the total assets held. Table 3 shows that at end of 2006 just 22% of the SIVs' assets were comprised of CDOs, a ratio not far off the 25% aggregate share of all CDOs held by the shadow banking system as a whole at that time. That this pattern pertained as much to the conduits as to the other shadow bank entities becomes clear from Table 4 that profiles the asset holdings of the ten largest conduits operating at the end of 2006. Only in two of the ten cases were CDOs the predominant asset class held; in the other eight cases other asset classes predominated. If this same situation was replicated throughout the entire 300 strong conduit community, as can be reasonably assumed, then it would seem that when the CDO market crashed in August 2007, the lending institutions in the wholesale money markets should have been more discriminating in deciding which particular borrowing institutions should be denied continued access to short-term funds. This did not happen. Rather, the panic amongst lenders sparked by the BNP Paribas announcement on 9 August 2007 was such that they immediately withdrew funding from virtually all borrowing institutions. This reaction may have seemed irrational but that, on the contrary, it was entirely understandable becomes clear as soon as the opaque and complex nature of the structured credit products is taken into consideration.

The cardinal rule of market exchange is that the properties of a product have to be sufficiently transparent as to allow it to be valued and traded

**Table 4** Ten largest conduits and sponsors (end-2006).

Program Name	Sponsor	ABCP (bn)	Guarantee	Asset Origin	Asset Rating	Asset Type (Share %)
Grampian Funding	HBOS	37.9	Full Liquidity	United States	AAA	Residential Mortgages (36%)
Amstel Funding	ABN Amro	30.7	Full Liquidity	Netherlands	AAA	CDO/CLO (84%)
Scaldis Capital	Fortis Bank	22.6	Full Liquidity	United States	AAA	Asset backed securities (77%)
Sheffield Receivables	Barclays	21.4	Full Liquidity	n.a.	NR	Mortgages (43%)
Morrigan TRR	Hypo Public	18.9	Full Credit	n.a.	n.a.	Bonds (51%)
Cancara Asset	Lloyds	18.8	Full Liquidity	Great Britain	AAA	Residential Mortgages (43%)
Solitaire Funding	HSBC	18.5	Full Liquidity	United States	AAA	Residential Mortgages (45%)
Rhineland Funding	IKB	16.7	Full Liquidity	United States	AAA	CDO/CLO (95%)
Mane Funding	ING	13.7	Full Liquidity	n.a.	AAA	Asset backed securities (91%)
Atlantis One	Rabobank	13.5	Full Liquidity	United States	NR	Commercial Loans (100%)

Source: Acharya *et al.* (2010).

against market standards. Government and corporate securities generally meet this criterion. So too do asset-backed securities. However, CDOs do not. They may only be ‘second floor securities’, but the jump in complexity going from ABS to CDOs is many times greater than the jump going from the ‘ground floor’ government and corporate debt securities to the ‘first floor’ asset backed securities. The reason has not only to do with the credit enhancement techniques used to construct CDOs. It also has to do with the heterogeneity of the asset classes used in their construction. Asset-backed securities have a transparent conformity in that each type has a single asset class as collateral (residential mortgage loans, credit card loans, commercial property loans, and so on). By contrast, no two individual CDOs were alike because of the large variety of ways in which different asset classes (sub-prime backed securities, other nonconforming loan backed securities, prime ABS, and so on) could be mixed together as the backing collateral. CDOs could still be sold, but only as unique, customised products tailored to suit the specific needs of specific investors. Ultimately, it was because the CDO market constituted a fragmented, relation-based domain rather than an integrated market domain as normally exists that explains why lending institutions in the money markets did not know who was exposed to CDOs and to what extent and why they decided to play safe and withdraw funding from virtually all borrowing institutions.

When the money markets froze up on the day of the BNP Paribas announcement (see Brunnermeier’s, 2009, event logbook), it was through the consequent withdrawal of liquidity from the conduits rather than from the SIVs that a crisis of confidence erupted in the inter-bank market. This was not only due to the differences in the size of assets held by these respective entities. Just as important were the differences in ownership and sponsorship structure. While some SIVs were sponsored by commercial banks, others were sponsored by investment banks, while yet others had multiple sponsors. This dispersion of sponsorship structure in the case of the SIVs helps to explain why it was that when they became

insolvent the negative effects were not concentrated on any one particular group of parent financial institutions. By contrast, the commercial banks took a huge hit following the financial collapse of the conduits because they owned or sponsored the great majority of them (270 out of the 300 or so operating in 2007).

When the short-term funding for these vehicles suddenly dried up, the assets held by them that had to be brought back onto the parent banks' balance sheets were of sufficient volume as to cause the trust between the banks to break down completely. The crux of the matter is that while the commercial banks had given a 100% guarantee to their conduits (a fact that explained their high credit ratings and consequent ability to issue ABCP at very advantageous rates) they had made no corresponding capital provision for the conduits' extensive \$1 trillion plus assets. This meant that the banks, already heavily reliant on short-term funding to help close the gap in the liability side of their balance sheets caused by the trend fall in household deposits, had to increase that reliance even further. Knowing that these short-term funding problems were common to all of them, the banks became extremely reluctant to lend to each other with the result that the liquidity-solvency crisis already under way threatened to spiral out of control. Indeed, had the major central banks not immediately pumped massive amounts of liquidity into the money markets in the summer of 2007 and beyond there is no doubt that the entire global financial system would have collapsed.

The conclusion that comes out of the above argument is that the 'endogenous' explanation of shadow banking growth and its consequences has plausibility in accounting for the damage done to the regular banking sector caused by the collapse of its off-balance-sheet conduits. While regulatory arbitrage and financial innovation were important enabling factors in the growth of the SPEs and SIVs and of their activities, with the principal driving force in this growth being investors' search for yield, the reverse was the case regarding the growth of the conduits and their activities. Certainly, there was strong demand for the ABCP issued by the conduits, but the major motivation behind the growth of these investment vehicles operated by the commercial banks was to take full advantage of financial innovation and lax regulation of off-balance-sheet entities and activities so as to maximise bank profits. As Acharya and Schnabl (2009) document, US and other advanced economy banks gained handsomely from exploiting regulatory arbitrage to establish conduits that issued ABCP sought by money market funds around the world.

## 5. SOME LESSONS

Nothing that has been said above should be interpreted to mean that we do not support tight regulation of the shadow banking system. On the

contrary, we fully endorse the moves in this direction. Rather, our ultimate aim in looking at the shadow banking system from a disaggregated perspective is to show that regulation of this system will not on its own suffice to prevent a future financial crisis. Indeed, we go so far as to conjecture that if tight regulation of the shadow banking system is not accompanied by certain wider initiatives that target the activities of other important financial players, then it is possible that this particular policy will make a future financial crisis more, not less, likely.

The thinking behind this conjecture centres on the continuing structural imbalance between the global supply of debt securities and the global demand for them and the consequent resurgent problem of yield. At the time of writing, it seems that regulating either the production of CDOs or the SIVs responsible for their production will have little relevance as both these financial instruments and financial institutions have been hit hard by the crisis. The long-term securities that will in the main be affected by current regulation insofar as they do continue to be created and distributed on a large-scale are of the ABS type. The problem here is that if the subjection of the bank-owned or sponsored SPEs – the major entities behind ABS production – to tight regulation results in a slowing down in the rate of that production, this could have potentially negative consequences because this slow down would come on top of the already existing constraints on the rate of growth of private sector securities.<sup>2</sup> The fact is that the detrimental effect on security supplies caused by the fall-out of the financial crisis has not been accompanied by a corresponding effect on the global demand for debt securities exercised by institutional asset managers and other investor groups. On the contrary, global demand for investable assets has continued to rise and while the expansion in government debt securities has gone some way to meet this increase in demand it has not gone far enough. The result is that the ‘search for yield’ phenomenon has again reared its head, as attested by the fact that investments in hedge funds and other speculative vehicles are again reaching record levels.

In sum, our argument is that regulation of the shadow banking sector, insofar as this affects ABS issuance, must be accompanied by other initiatives aimed at resolving the bond market supply and demand imbalance and thus eliminating the risk of a return of financial products and processes of the type that caused the last financial crisis. On the supply side of the equation, the governments of the leading advanced market economies should be encouraged to continue with bond-financed expansionary fiscal policies. Given that investors in this post-crisis era continue to need more supplies of ‘safe haven’ stores of value (as evidenced by the low yields on US, UK, German and other core economy government bonds that persist even while government debt to GDP ratios remain at unusually high levels in these countries) one could expect these

governments to continue a programme of debt-financed fiscal expansion for as long as the post-crisis global economy remains in a depressed state. On the demand side of the equation, a possible policy initiative is to target the huge accumulations of wealth concentrated in the hands of the world's super rich. Given that well over half of the \$45 trillion worth of assets currently owned by HNWI's are held in equity and debt securities, it follows that government coordinated taxes on this private wealth would help to significantly reduce the pressure of demand for yield bearing securities.

## 6. CONCLUSION

The implications of our analysis for the study of shadow banking and financial innovation in the crisis are twofold. First, focusing on the role of the products of unregulated financial innovation, it opens up a 'stock' perspective on the shadow banking system, as opposed to more conventional flow accounts perspectives that have characterised much of the current literature on the phenomenon. Second, our linkage of CDO production to the strong demand for safe assets suggests that unlike many earlier financial crises, the global credit meltdown of 2007–9 was not caused chiefly by speculation, greed or exuberance. These factors certainly all played a role, as has been well documented, but they should not be allowed to detract from the importance of investor pressures on the shadow banking system to create the toxic securities that caused the financial system to go into cardiac arrest. This point has important policy implications. The shadow banking system that was instrumental in the recent and some argue, ongoing financial crisis, will in many ways cease to exist following regulations aimed at divesting the system of the very attributes that caused it to be so named in the first place. While there can be no doubt that such regulation is very appropriate even though very belated, there is doubt as to whether it will suffice to prevent a future financial crisis. This issue will be resolved not only by understanding the role played by both the regulated and unregulated parts of the banking system in the last financial crisis but also by understanding the various external pressures on the banking system to play the role that it did. This paper has sought to make a contribution to this task.

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## NOTES

1. Bakk-Simon *et al.* (2012), writing under the auspices of the European Central Bank, follow the FSB's definition of the shadow banking system.
2. Gorton and Metrick (2010) have proposed that following the 'run on the repo', which in their view caused the financial crisis of 2007–8, there should be tighter restrictions on the creation and distribution of ABSs, the long-term securities that provided much of the collateral fodder for the short-term repo transactions. However, what their proposal ignores is the fact that a good deal of the ABSs created before the crisis were held by pension funds and other institutional investors and were not financed by short-term repos. To quote from Shleifer's critical comment on the Gorton-Metrick proposal: 'at least some, and possibly a good part, of ABSs were acquired by pension funds, insurance companies, and even government sponsored enterprises. For these buyers, short term financing was probably much less important. The reason this observation is of some consequence is that Gorton and Metrick's regulatory proposal would require that ABSs be maturity transformed, which presumably would prevent their being sold to investors in long-term securities. I am far from certain that this would be desirable' (Shleifer, 2010: 300).

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